REMARKS

Applicant intends this response to be a complete response to the Examiner's **22 August 2005** Non-Final Office Action. Applicant has labeled the paragraphs in his response to correspond to the paragraph labeling in the Office Action for the convenience of the Examiner.

Claim Objections

1. **Claims 10-13** stand objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in alternative only. See MPEP § 608.01(n). Accordingly, the claims 10-13 have not been further treated on the merits.

Claim Rejections - 35 USC §. 101

2. **Claim 5** stands rejected under 35 U.S.C. 101 because the claimed invention lacks patentable utility. This is merely a mathematical calculation which does not provide any tangible results. Applicants have canceled claim 5, rendering this rejection moot.

Claim Rejections - 35 USC § 112

4. **Claims 1-4, and 6-9** stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1:

- "Calculating $\tilde{V}_1[n]$ is indefinite as the function is not defined in the claim.
- "Absolutely and uniformly convergence" is grammatically incorrect.
- "Amenable to efficient iterative computational determination" is unclear as the metes and bounds of "amenable" and " efficient" cannot be determined.
- "Allowing for fast tentative identification" is unclear as the metes and bounds of "fast" cannot be determined.

5. Regarding claim 2, n cannot be equal both 0 and 1.

6. Regarding claim 3, "n=1" conflicts with claim 2 wherein "n=0".

7. Regarding claim 4, the relation of '1) to ;(z) is unclear and the terms are undefined.

8. Regarding claim 6: .

- "Utilizes equations" is indefinite as the "equations" is not defined.
- "Amenable to efficient iterative computational determination" is unclear as the metes and bounds of "amenable" and " efficient" cannot be determined.
- "Allowing for fast tentative identification" is unclear as the metes and bounds of

"fast" cannot be determined.

- "Mixtures or combinations" is unclear as the metes and bounds of "mixtures or combinations" cannot be determined.
- "An inverse scattering equations" is grammatically incorrect.
- "Equations" is not defined.
- "Function v1lnJ" is undefined.
- "Adequate potential function" is unclear as the metes and bounds of "adequate" cannot be determined.
- "First few leading terms" is indefinite because "terms" is undefined.

9. Regarding claim 7, "first few terms comprise the first four terms" is indefinite.

10. Regarding claim 8, "first few terms comprise the first three terms" is indefinite.

11. Regarding claim 9, "first few terms comprise the first two terms" is indefinite.

Applicants have canceled claims 1-9 and new claims 14-21 are free of the offending indefinite rejection. Applicants, therefore, respectfully request withdrawal of these section 112 rejections.

Claim Rejections - 35 USC § 102

13. **Claims 1-9** stand rejected under 35 U.S.C. 102(b) as being anticipated by "The approximate inverse for solving an inverse scattering problem for acoustic waves in an inhomogeneous medium," (the Abdullah article).

The present invention relates to a reformulating the Lippmann-Schwinger equation as a Volterra equation. The Lippmann-Schwinger equation is not directly solvable because both terms inside the integral are unknown. Moreover, direct solution to this equation are generally problematic because the is no assurance that the equation will converge to a solution when an iterative solution mechanism is applied. However, if the reflectance and transmission spectra of an object are measured, then the Lippmann-Schwinger equation can be transformed into an equation, where the emeasured transmission and reflectance spectrum are used to transform the Lippmann-Schwinger equation producing iterative solutions because the transformed equation is uniformly and absolutely convergent.

The Abdullah article does not use a Volterra-based interactive approach to solve the Lippmann-Schwinger equation. Instead, the Abdullah article replaces the integral product with a single term to form a linear integral equation. The problem with such an equation is that it gives rise

to an infinite number of solutions. To solve the integral equation, Abdullah regularizes the equation using a singular valued decompositions. Thus, Abdullah method works on producing real data on a grid and solving the Lippmann-Schwinger equation using quadratic integration. The two methods are fundamentally different.

Because the Abdullah article does not disclose a Volterra-based iterative solution to the scattering problem, the Abdullah article cannot anticipate claim 14-21 and 10-13. Moreover, the Abdullah article does not even suggest the use of a Volterra-based iterative solution to the scattering problem, which would be needed for an obviousness challenge.

Having fully responded to the Examiner's Non-Final Office Action, Applicant respectfully urges that is application be passed onto allowance.

If it would be of assistance in resolving any issues in this application, the Examiner is kindly invited to contact applicant's attorney Robert W. Strozier at 713.977.7000

Date: **January 23, 2006**

Respectfully submitted,

Robert W. Strozier
Reg. No. 34,024